Vol. 55, pp. 71–74 June 25, 1942

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW FROG OF THE GENUS *MICRIXALUS* FROM TRAVANCORE.

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Among the frogs collected by Dr. Albert W. Herre for the Natural History Nuseum of Stanford University during his Asiatic expedition of 1940–41 is a small frog from Travancore which appears to represent an unknown species.

Micrixalus herrei, new species.

Diagnosis.—A *Micrixalus* with complete dorsolateral folds but no lingual papilla; canthus rostralis very sharp and lores vertical; loreal section of canthal line strongly concave and the tip of the snout bluntly rounded when frog is viewed from above; snout strongly projecting and sharp in profile; eyes very large and as long as the snout measured obliquely from its tip to one of the eyes; upper eyelid slightly wider than interorbital space; tympanum small but distinct except for that part of border near the strong post-tympanal fold; toes fully webbed except for the fourth, which has only a narrow fringe along the penultimate phalanx, the web involving the rather large disks of all the toes except the fourth; tibiotarsal articulation reaching just past snout tip when leg is brought forward; skin of dorsal surface of body, upper eyelids, and upper surface of legs granulated.

Holotype.—Stanford Amph. Cat. no. 7,265, an adult male taken at Kallar, 30 miles northeast of Trivandrum, Travancore, South India, in the foothills, by Dr. Albert W. Herre, on June 19, 1941. The river at Kallar broadens into a large pool above the village, the bank of the pool on the side opposite the village being high and rocky. Dr. Herre collected below the pool and the bridge at its lower end, and on the rocky side, but believes that this small frog came from a small swift brook flowing into the river above the high rocky part of the pool bank. Only one example was taken.

Description.—Tongue narrow, shallowly bifurcate behind, without any central pointed papilla. Male with two internal vocal sacs, the openings large but inconspicuous. Snout tip scarcely pointed, rather rounded when viewed from above, but this rounded contour is broken at the nostrils; posterior to these the snout contour, as seen from above, is represented by the line of the canthus rostralis, which is distinctly *concave* from the nostrils to the eyes. The appearance of the snout is therefore very different from

that of *M. fuscus*, which is long and pointed and convex on the sides when viewed from above. In profile, the snout greatly overhangs the mouth, its tip being very acutely pointed, and the profile line from the tip to the upper lip is concave. Canthus rostralis sharply angular, the lores being vertical and somewhat concave. Nostril midway between eye and tip of snout. Eyes very large and prominent, as long as the snout when the latter is measured obliquely from one of the eyes to the snout tip, much larger than those of *M. fuscus*. Upper eyelid wide and prominent, very slightly wider than the interorbital space. Tympanum small, about two-fifths eye, its anterior part perfectly clear but the posterior rim, next to the post-tympanal fold, is obliterated. General body form rather slender, the frog very closely resembling some of the small *Phyllobates* of the *nubicola* type.

Fingers free of web, slender, first slightly shorter than second, which is about equal to the fourth and extends to the proximal end of the penultimate phalanx of the third. Disks large, somewhat flat-ended, that of third toe largest and quite or almost rwice as wide as narrowest part of penultimate phalanx. Disks with a deep circum-marginal groove but no transverse inferior one. First finger of male type swollen, with a large, very finely granulated, white nuptial pad on its inner-superior surface.

Toes slender, completely webbed, the web involving the disks of all the toes. On the fourth toe, however, the web is constricted at the base of the penultimate phalanx, and runs up to the disk only as an exceedingly narrow fringe. Disks of toes like those of fingers and of about the same size. Outer metatarsals separated by web only in the distal third or fourth; the rest of the distance they are tightly bound together, with scarcely even a groove separating them. No outer metatarsal fold, but its location is marked by a single rather regular row of tiny white tubercles, which also run out along the base of the outer finger. No outer metatarsal tubercle. A flattened oval inner metatarsal tubercle, its distal end slightly free.

Legs moderately stout, the heels slightly overlapping when femur and tibia are placed at right angles to body, the tibiotarsal articulation reaching just beyond tip of snout when leg is brought forward.

Skin of entire dorsum, head, upper eyelids, upper parts of sides and upper surfaces of legs evenly granular, a few larger granules being present only on the posterior dorsum and tibia; the granulation is rather coarse for so small a frog. All of the dorsal granules, including the slightly enlarged ones on the posterior part of the back and legs, each bears an exceedingly minute erect dark spine. Dorsolateral folds well developed and conspicuous but narrow; they are even and continuous, run from the eye to the groin, and mark the considerable angle between the rather flat dorsum and the down-slope of the sides. A strongly developed tympanal fold from eye, over and down behind tympanum, fading out near insertion of arm. An elongate, oblique, white, glandular wart from near postero-inferior border of tympanum down towards arm. Under surfaces of body and legs perfectly smooth.

Top of head and dorsum between the dorsolateral folds brown, obscurely mottled and marbled with lighter and dark areas, one of the latter forming an obscure interocular bar and another a large, somewhat triangular spot

on the middle of the back. Sides below the dorsolateral folds black, this joining the white ventral color in bold mottling and marbling along the lower sides, especially posteriorly. Sides of snout dark, with irregular light areas on upper lip and subocular region. Antero-inferior edge of tympanum white, forming an oblique white bar with the white elongate wart mentioned above. Undersurface of body white, boldly mottled and marbled with brown on the breast, and increasingly so on throat, which bears a not too well defined median white line. Lower lip barred. Upper surfaces of arms dark, with a few obscure whitish crossbands. Upper surfaces of femur and tibia with three or four irregular, wide, brown crossbands, the interspaces lighter brown and the light interspace nearest the groin almost white anteriorly, perhaps indicating a bright color spot in this region. Posterior surface of thigh solid dark brown with a narrow white line extending from vent to near the undersurface of the articulation of the femur and tibia. This line is like that of *M. fuscus*, but is strongly oblique instead of horizontal. Under side of thighs light, the anterior part becoming mottled. Under side of calf heavily mottled with brown. Hidden part of groin white, probably indicating a bright color spot confluent with the first light interspace between the anterior parts of the superior thigh crossbands.

Measurements of type.—Length from snout tip to end of coccyx 17.5 mm. Snout from tip to one of the eyes 3 mm. Horizontal diameter of eye 3 mm. Femur (from coccyx) 11 mm. Tibia 11 mm. Foot (approximate) 13 mm. To indicate how I have made these measurements, the same measurements taken on Boulenger's type figure of *M. fuscus* are as follows: Length 25.5. Snout 4.5. Eye 3.0. Femur 15. Tibia 15.5. Foot (approximate) 18.5. The type of *herrei* is preserved in about the same posture shown in Boulenger's figure and my measurements have been taken without changing the positions of the limbs.

Comparisons.—Other than the five South Indian species of *Micrixalus* treated by Boulenger in 1890 (*Fauna Brit. India*, Rept. Batr., pp. 464–467) I know of only four species having been described. They are:

Micrixalus borealis Annandale, 1912, *Rec. Ind. Mus.*, vol. 8, no. 1, p. 10, pl. 2, fig. 2 (Rotung, on the Dihang River of the Brahmaputra System, Abor Country, N. E. India).

Micrixalus dimunitiva Taylor, 1922, *Philippine J. Sci.*, vol. 21, no. 3, p. 267, pl. 1, figs. 3–4, pl. 2, figs. 2–3 (near Pasananka, Zamboanga, S. W. Mindanao; Jolo, Sulu Islands).

Micrixalus torrentis Malcolm Smith, 1923, *J. Nat. Hist. Soc. Siam*, vol. 6, pp. 195–212 (Wuchih Mts., Hainan).

?Micrixalus tenasserimensis (Sclater), *Proc. Zool. Soc. London*, 1892, p. 345, pl. 24, figs. 4–4a (Tenasserim). This small frog was described by Sclater as a *Rana*. Annandale (loc. cit. supra) says that some examples have vomerine teeth, others not, and presumes it to be close to his *M. borealis*. Boulenger (1918, *Ann. Mag. Nat. Hist.*, ser. 9, vol. 1, p. 373) places it in *Cornufer*, but Malcolm Smith (1930, *Bull. Raffles Mus.*, no. 3, p. 102) says it is related to the South Indian *Rana beddomii* and refers it to the subgenus *Discodeles* of *Rana*.

None of these four species seems to be at all close to *Micrixalus herrei*,

and Taylor's description and figures lead me to believe that *dimunitiva* does not belong in a genetic series with the other species.

Of the five hitherto known South Indian and Ceylonese species, *saxicola* and *sarasinorum* lack the dorsolateral glandular folds, and *opisthorhodus*, which has them, possesses a lingual papilla. These can not be close to *herrei*, which lacks the papilla but possesses the folds. Of the two remaining species, *silvaticus* has the toes only one-third to two-fifths webbed, and the legs much shorter than *herrei*. *M. fuscus* (Boulenger, 1882, *Cat. Batr. Sal.*, p. 96, pl. 10, fig. 3) agrees most closely with *herrei* and is undoubtedly its closest known relative. *M. herrei* differs distinctively from *fuscus* in (1) the longer legs, (2) the granular dorsum, (3) the very differently shaped snout, (4) the much larger and more prominent eyes, (5) the much smaller size, and (6) the narrower and more oblique white line on the hindside of the thigh, as well as in other details of coloring. Of these, numbers 3 and 4 are probably the most distinctive. I am quite aware that some of these apparent differences may be due to Boulenger having used his larger specimens (females) for most points in his description, while my only example is a male, and of the danger of basing new forms on single specimens. However, the differences shown by my frog are very clear-cut and I do not believe that sexual differences will account for all of them, especially the eye size. It may be added that little has been published in regard to these little South Indian frogs save for the very brief, formal original descriptions, and if the true situation in regard to their specific status is in any way similar to that in their New World analogues, the forms of *Phyllobates*, the species are doubtless more numerous than now realized and their true specfic characters are probably not fully brought out by the short, formalized descriptions in vogue when they were named.

Notes on the genus.—I am not aware that a type has been designated for *Micrixalus* and I hereby name *Ixalus fuscus* Boulenger 1882 as type of the genus. Roux (1905, *Zool. Anz.*, vol. 28, p. 779) reduces *Micrixalus* to the synonymy of *Staurois*, a genus whose limits have been agreed upon by but few authors. *M. herrei* rather strikingly reminds one of such rough, mottled species of *Staurois* as *natator*, *afghana*, and *larutensis*. Noble (1931, *Biol. Amphib.*, p. 521) says of *Micrixalus:* ". . . a group of small species of *Hylarana* lacking vomerine teeth. It grades into *Staurois* and differs from some species of that genus only in its *Rana*-like tadpole." I am not at all sure that all the species of *Micrixalus* form a phylogenetic unit. The loss of the vomerine teeth is a very superficial character that has appeared time and again in the frogs. I have indicated above that I do not believe the Philippine *dimunitiva* is directly related to the other species, and the difficulty with *tenasserimensis* has been mentioned. It has seemed to me that the strange, pointed lingual papilla that so often crops up in Asiatic Ranids may be of more importance than suspected, and it is possible that proper investigation of it and of a number of other known but neglected characters might change considerably our ideas of the phylogenetic relationships of many of the Ranidae.

I take great pleasure in naming this strange little frog for my friend and colleague, Dr. Albert W. Herre, Curator of Ichthyology in the Natural History Museum of Stanford University.